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Rotorcraft Flying Handbook

U.S. Department of Transportation
Federal Aviation Administration

CHAPTER 14 Helicopter
Aeronautical Decision Making

Aeronautical decision making (ADM) is a systematic approach to the mental process used by pilots to consistently determine the best course of action in response to a given set of circumstances. The importance of learning effective ADM skills cannot be overemphasized. While progress is continually being made in the advancement of pilot training methods, aircraft equipment and systems, and services for pilots, accidents still occur. Despite all the changes in technology to improve flight safety, one factor remains the same—the human factor. It is estimated that approximately 65 percent of the total rotorcraft accidents are **human factors** related.

Historically, the term "pilot error" has been used to describe the causes of these accidents. Pilot error means that an action or decision made by the pilot was the cause of, or a contributing factor that lead to, the accident. This definition also includes the pilot's failure to make a decision or take action. From a broader perspective, the phrase "human factors related" more aptly describes these accidents since it is usually not a single decision that leads to an accident, but a chain of events triggered by a number of factors.

The poor judgment chain, sometimes referred to as the "error chain," is a term used to describe this concept of contributing factors in a human factors related accident. Breaking one link in the chain normally is all that is necessary to change the outcome of the sequence of events. The following is an example of the type of scenario illustrating the poor judgment chain.

Human Factors—The study of how people interact with their environments. In the case of general aviation, it is the study of how pilot performance is influenced by such issues as the design of cockpits, the function of the organs of the body, the effects of emotions, and the interaction and communication with the other participants of the aviation community, such as other crew members and air traffic control personnel.

A helicopter pilot, with limited experience flying in adverse weather, wants to be back at his home airport in time to attend an important social affair. He is already 30 minutes late. Therefore, he decides not to refuel his helicopter, since he should get back home with at least 20 minutes of reserve. In addition, in spite of his inexperience, he decides to fly through an area of possible thunderstorms in order to get back just before dark. Arriving in the thunderstorm area, he encounters lightning, turbulence, and heavy clouds. Night is approaching, and the thick cloud cover makes it very dark. With his limited fuel supply, he is not able to circumnavigate the thunderstorms. In the darkness and turbulence, the pilot becomes spatially disoriented while attempting to continue flying with visual reference to the ground instead of using what instruments he has to make a 180° turn. In the ensuing crash, the pilot is seriously injured and the helicopter completely destroyed.

By discussing the events that led to this accident, we can understand how a series of judgmental errors contributed to the final outcome of this flight. For example, one of the first elements that affected the pilot's flight was a decision regarding the weather. The pilot knew there were going to be thunderstorms in the area, but he had flown near thunderstorms before and never had an accident.

Next, he let his desire to arrive at his destination on time override his concern for a safe flight. For one thing, in order to save time, he did not refuel the helicopter, which might have allowed him the opportunity to circumnavigate the bad weather. Then he overestimated his flying abilities and decided to use a route that took him through a potential area of thunderstorm activity. Next, the pilot pressed on into obviously deteriorating conditions instead of changing course or landing prior to his destination.

On numerous occasions during the flight, the pilot could have made effective decisions that may have prevented this accident. However, as the chain of events unfolded, each poor decision left him with fewer and fewer options. Making sound decisions is the key to preventing accidents. Traditional pilot training has

emphasized flying skills, knowledge of the aircraft, and familiarity with regulations. ADM training focuses on the decision-making process and the factors that affect a pilot's ability to make effective choices.

ORIGINS OF ADM TRAINING

The airlines developed some of the first training programs that focused on improving aeronautical decision making. Human factors-related accidents motivated the airline industry to implement crew resource management (CRM) training for flight crews. The focus of CRM programs is the effective use of all available resources; human resources, hardware, and information. Human resources include all groups routinely working with the cockpit crew (or pilot) who are involved in decisions that are required to operate a flight safely. These groups include, but are not limited to: ground personnel, dispatchers, cabin crewmembers, maintenance personnel, external-load riggers, and air traffic controllers. Although the CRM concept originated as airlines developed ways of facilitating crew cooperation to improve decision making in the cockpit, CRM principles, such as workload management, situational awareness, communication, the leadership role of the captain, and crewmember coordination have direct application to the general aviation cockpit. This also includes single pilot operations since pilots of small aircraft, as well as crews of larger aircraft, must make effective use of all available resources—human resources, hardware, and information. You can also refer to AC 60-22, *Aeronautical Decision Making*, which provides background references, definitions, and other pertinent information about ADM training in the general aviation environment. [Figure 14-1]

DEFINITIONS

ADM is a systematic approach to the mental process used by pilots to consistently determine the best course of action in response to a given set of circumstances.

ATTITUDE is a personal motivational predisposition to respond to persons, situations, or events in a given manner that can, nevertheless, be changed or modified through training as sort of a mental shortcut to decision making.

ATTITUDE MANAGEMENT is the ability to recognize hazardous attitudes in oneself and the willingness to modify them as necessary through the application of an appropriate antidote thought.

CREW RESOURCE MANAGEMENT (CRM) is the application of team management concepts in the flight deck environment. It was initially known as cockpit resource management, but as CRM programs evolved to include cabin crews, maintenance personnel, and others, the phrase crew resource management was adopted. This includes single pilots, as in most general aviation aircraft. Pilots of small aircraft, as well as crews of larger aircraft, must make effective use of all available resources; human resources, hardware, and information. A current definition includes all groups routinely working with the cockpit crew who are involved in decisions required to operate a flight safely. These groups include, but are not limited to: pilots, dispatchers, cabin crewmembers, maintenance personnel, and air traffic controllers. CRM is one way of addressing the challenge of optimizing the human/machine interface and accompanying interpersonal activities.

HEADWORK is required to accomplish a conscious, rational thought process when making decisions. Good decision making involves risk identification and assessment, information processing, and problem solving.

JUDGMENT is the mental process of recognizing and analyzing all pertinent information in a particular situation, a rational evaluation of alternative actions in response to it, and a timely decision on which action to take.

PERSONALITY is the embodiment of personal traits and characteristics of an individual that are set at a very early age and extremely resistant to change.

POOR JUDGMENT CHAIN is a series of mistakes that may lead to an accident or incident. Two basic principles generally associated with the creation of a poor judgment chain are: (1) One bad decision often leads to another; and (2) as a string of bad decisions grows, it reduces the number of subsequent alternatives for continued safe flight. ADM is intended to break the poor judgment chain before it can cause an accident or incident.

RISK ELEMENTS IN ADM take into consideration the four fundamental risk elements: the pilot, the aircraft, the environment, and the type of operation that comprise any given aviation situation.

RISK MANAGEMENT is the part of the decision making process which relies on situational awareness, problem recognition, and good judgment to reduce risks associated with each flight.

SITUATIONAL AWARENESS is the accurate perception and understanding of all the factors and conditions within the four fundamental risk elements that affect safety before, during, and after the flight.

SKILLS and PROCEDURES are the procedural, psychomotor, and perceptual skills used to control a specific aircraft or its systems. They are the airmanship abilities that are gained through conventional training, are perfected, and become almost automatic through experience.

STRESS MANAGEMENT is the personal analysis of the kinds of stress experienced while flying, the application of appropriate stress assessment tools, and other coping mechanisms.

Figure 14-1. These terms are used in AC 60-22 to explain concepts used in ADM training.

THE DECISION-MAKING PROCESS

An understanding of the decision-making process provides you with a foundation for developing ADM skills. Some situations, such as engine failures, require you to respond immediately using established procedures with little time for detailed analysis. Traditionally, pilots have been well trained to react to emergencies, but are not as well prepared to make decisions that require a more reflective response. Typically during a flight, you have time to examine any changes that occur, gather information, and assess risk before reaching a decision. The steps leading to this conclusion constitute the decision-making process.

DEFINING THE PROBLEM

Problem definition is the first step in the decision-making process. Defining the problem begins with recognizing that a change has occurred or that an expected change did not occur. A problem is perceived first by the senses, then is distinguished through insight and experience. These same abilities, as well as an objective analysis of all available information, are used to determine the exact nature and severity of the problem.

While doing a hover check after picking up fire fighters at the bottom of a canyon, you realize that you are only 20 pounds under maximum gross weight. What you failed to realize is that they had stowed some of their heaviest gear in the baggage compartment, which shifted the CG slightly behind the aft limits. Since weight and balance had never created any problems for you in the past, you did not bother to calculate CG and power required. You did, however, try to estimate it by remembering the figures from earlier in the morning at the base camp. At a 5,000 foot density altitude and maximum gross weight, the performance charts indicated you had plenty of excess power. Unfortunately, the temperature was 93°F and the pressure altitude at the pick up point was 6,200 feet (DA = 9,600 feet). Since there was enough power for the hover check, you felt there was sufficient power to take off.

Even though the helicopter accelerated slowly during the takeoff, the distance between the helicopter and the ground continued to increase. However, when you attempted to establish the best rate of climb speed, the nose wanted to pitch up to a higher than normal attitude, and you noticed that the helicopter was not gaining enough altitude in relation to the canyon wall a couple hundred yards ahead.

CHOOSING A COURSE OF ACTION

After the problem has been identified, you must evaluate the need to react to it and determine the actions that need to be taken to resolve the situation in the time available. The expected outcome of each possible action should be considered and the risks assessed before you decide on a response to the situation.

Your first thought was to pull up on the collective and yank back on the cyclic, but after weighing the consequences of possibly losing rotor r.p.m. and not being able to maintain the climb rate sufficiently enough to clear the canyon wall, which is now only a hundred yards away, you realize that your only course is to try to turn back to the landing zone on the canyon floor.

IMPLEMENTING THE DECISION AND EVALUATING THE OUTCOME

Although a decision may be reached and a course of action implemented, the decision-making process is not complete. It is important to think ahead and determine how the decision could affect other phases of the flight. As the flight progresses, you must continue to evaluate the outcome of the decision to ensure that it is producing the desired result.

As you make your turn to the downwind, the airspeed drops nearly to zero, and the helicopter becomes very difficult to control. At this point, you must increase airspeed in order to maintain translational lift, but since the CG is aft of limits, you need to apply more forward cyclic than usual. As you approach the landing zone with a high rate of descent, you realize that you are in a potential settling-with-power situation if you try to trade airspeed for altitude and lose ETL. Therefore, you will probably not be able to terminate the approach in a hover. You decide to make as shallow of an approach as possible and perform a run-on landing.

The decision making process normally consists of several steps before you choose a course of action. To help you remember the elements of the decision-making process, a six-step model has been developed using the acronym “DECIDE.” [Figure 14-2]

DECIDE MODEL

Detect the fact that a change has occurred.
Estimate the need to counter or react to the change.
Choose a desirable outcome for the success of the flight.
Identify actions which could successfully control the change.
Do the necessary action to adapt to the change.
Evaluate the effect of the action.

Figure 14-2. The DECIDE model can provide a framework for effective decision making.

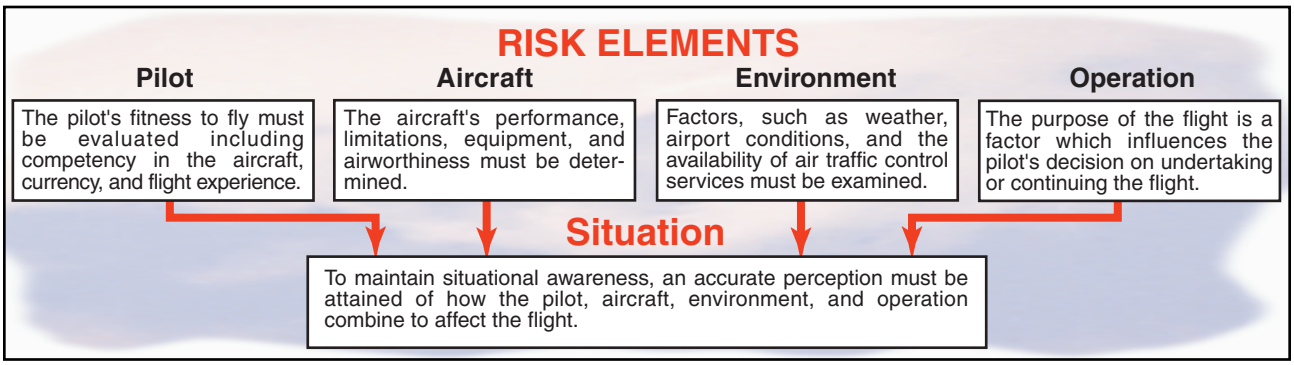

Figure 14-3. When situationally aware, you have an overview of the total operation and are not fixated on one perceived significant factor.

RISK MANAGEMENT

During each flight, decisions must be made regarding events that involve interactions between the four **risk elements**—the pilot in command, the aircraft, the environment, and the operation. The decision-making process involves an evaluation of each of these risk elements to achieve an accurate perception of the flight situation. [Figure 14-3]

One of the most important decisions that a pilot in command must make is the go/no-go decision. Evaluating each of these risk elements can help you decide whether a flight should be conducted or continued. Let us evaluate the four risk elements and how they affect our decision making regarding the following situations.

Pilot—As a pilot, you must continually make decisions about your own competency, condition of health, mental and emotional state, level of fatigue, and many other variables. For example, you are called early in the morning to make a long flight. You have had only a few hours of sleep, and are concerned that the congestion you feel could be the onset of a cold. Are you safe to fly?

Aircraft—You will frequently base decisions on your evaluations of the aircraft, such as its powerplant, performance, equipment, fuel state, or airworthiness. Picture yourself in this situation: you are en route to an oil rig an hour's flight from shore, and you have just passed the shoreline. Then you notice the oil temperature at the high end of the caution range. Should you continue out to sea, or return to the nearest suitable heliport/airport?

Environment—This encompasses many elements not pilot or aircraft related. It can include such factors as weather, air traffic control, navaids, terrain, takeoff and landing areas, and surrounding obstacles. Weather is one element that can change drastically over time and distance. Imagine you are ferrying a helicopter cross country and encounter unexpected low clouds and rain in an area of rising terrain. Do you try to stay under them and "scud run," or turn around, stay in the clear, and obtain current weather information?

Operation—The interaction between you as the pilot, your aircraft, and the environment is greatly influenced by the purpose of each flight operation. You must evaluate the three previous areas to decide on the desirability of undertaking or continuing the flight as planned. It is worth asking yourself why the flight is being made, how critical is it to maintain the schedule, and is the trip worth the risks? For instance, you are tasked to take some technicians into rugged mountains for a routine survey, and the weather is marginal. Would it be preferable to wait for better conditions to ensure a safe flight? How would the priorities change if you were tasked to search for cross-country skiers who had become lost in deep snow and radioed for help?

ASSESSING RISK

Examining **NTSB** reports and other accident research can help you to assess risk more effectively. For example, the accident rate decreases by nearly 50 percent once a pilot obtains 100 hours, and continues to decrease until the 1,000 hour level. The data suggest that for the first 500 hours, pilots flying VFR at night should establish higher personal limitations than are required by the regulations and, if applicable, apply instrument flying skills in this environment. [Figure 14-4]

Studies also indicate the types of flight activities that are most likely to result in the most serious accidents. The majority of fatal general aviation accident causes fall under the categories of maneuvering flight, approaches, takeoff/initial climb, and weather. Delving deeper into accident statistics can provide some important details that can help you to understand the risks involved with specific flying situations. For example, maneuvering flight is one of the largest single produc-

Risk Elements—The four components of a flight that make up the overall situation.

NTSB—National Transportation Safety Board.

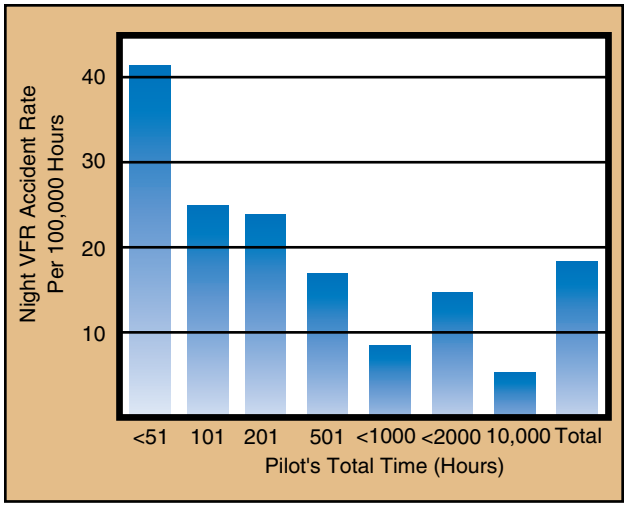

Figure 14-4. Statistical data can identify operations that have more risk.

ers of fatal accidents. Fatal accidents, which occur during approach, often happen at night or in IFR conditions. Takeoff/initial climb accidents frequently are due to the pilot's lack of awareness of the effects of density altitude on aircraft performance or other improper takeoff planning resulting in loss of control during, or shortly after takeoff. The majority of weather-related accidents occur after attempted VFR flight into IFR conditions.

FACTORS AFFECTING DECISION MAKING

It is important to point out the fact that being familiar with the decision-making process does not ensure that you will have the good judgment to be a safe pilot. The ability to make effective decisions as pilot in command depends on a number of factors. Some circumstances, such as the time available to make a decision, may be beyond your control. However, you can learn to recognize those factors that can be managed, and learn skills to improve decision-making ability and judgment.

PILOT SELF-ASSESSMENT

The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft. In order to effectively exercise that responsibility and make effective decisions regarding the outcome of a flight, you must have an understanding of your limitations. Your performance during a flight is affected by many factors, such as health, recency of experience, knowledge, skill level, and attitude.

Exercising good judgment begins prior to taking the controls of an aircraft. Often, pilots thoroughly check their aircraft to determine airworthiness, yet do not evaluate their own fitness for flight. Just as a checklist is used when preflighting an aircraft, a personal checklist based on such factors as experience, currency, and comfort level can help determine if you are prepared for a particular flight. Specifying when refresher training should be accomplished and designating weather minimums, which may be higher than those listed in Title 14 of the Code of Federal Regulations (14 CFR) part 91, are elements that may be included on a personal checklist. In addition to a review of personal limitations, you should use the I'M SAFE Checklist to further evaluate your fitness for flight. [Figure 14-5]

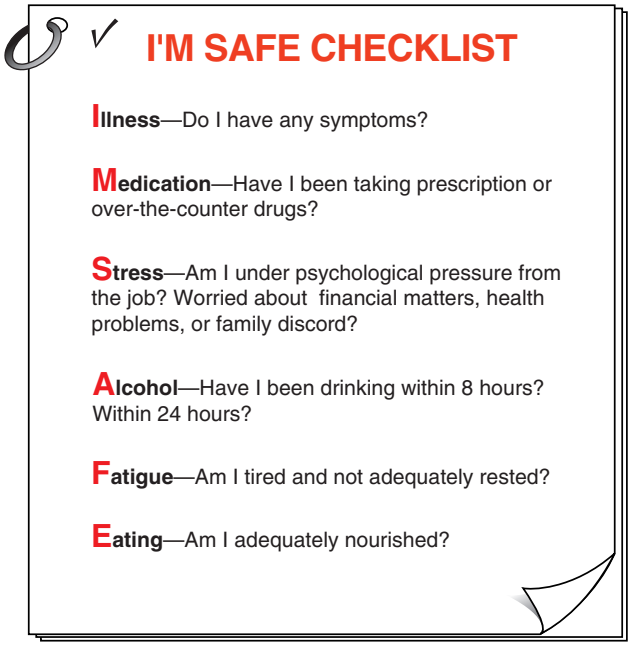

Figure 14-5. Prior to flight, you should assess your fitness, just as you evaluate the aircraft's airworthiness.

RECOGNIZING HAZARDOUS ATTITUDES

Being fit to fly depends on more than just your physical condition and recency of experience. For example, attitude affects the quality of your decisions. Attitude can be defined as a personal motivational predisposition to respond to persons, situations, or events in a given manner. Studies have identified five hazardous attitudes that can interfere with your ability to make sound decisions and exercise authority properly. [Figure 14-6]

Hazardous attitudes can lead to poor decision making and actions that involve unnecessary risk. You must examine your decisions carefully to ensure that your choices have not been influenced by hazardous attitudes, and you must be familiar with positive alternatives to counteract the hazardous attitudes. These substitute attitudes are referred to as antidotes. During a flight operation, it is important to be able to recognize

THE FIVE HAZARDOUS ATTITUDES	
1. Anti-Authority: **"Don't tell me."**	This attitude is found in people who do not like anyone telling them what to do. In a sense, they are saying, "No one can tell me what to do." They may be resentful of having someone tell them what to do, or may regard rules, regulations, and procedures as silly or unnecessary. However, it is always your prerogative to question authority if you feel it is in error.
2. Impulsivity: **"Do it quickly."**	This is the attitude of people who frequently feel the need to do something, anything, immediately. They do not stop to think about what they are about to do; they do not select the best alternative, and they do the first thing that comes to mind.
3. Invulnerability: **"It won't happen to me."**	Many people feel that accidents happen to others, but never to them. They know accidents can happen, and they know that anyone can be affected. They never really feel or believe that they will be personally involved. Pilots who think this way are more likely to take chances and increase risk.
4. Macho: **"I can do it."**	Pilots who are always trying to prove that they are better than anyone else are thinking, "I can do it –I'll show them." Pilots with this type of attitude will try to prove themselves by taking risks in order to impress others. While this pattern is thought to be a male characteristic, women are equally susceptible.
5. Resignation: **"What's the use?"**	Pilots who think, "What's the use?" do not see themselves as being able to make a great deal of difference in what happens to them. When things go well, the pilot is apt to think that it is good luck. When things go badly, the pilot may feel that someone is out to get me, or attribute it to bad luck. The pilot will leave the action to others, for better or worse. Sometimes, such pilots will even go along with unreasonable requests just to be a "nice guy."

Figure 14-6. You should examine your decisions carefully to ensure that your choices have not been influenced by a hazardous attitude.

HAZARDOUS ATTITUDES	ANTIDOTES
Macho—Brenda often brags to her friends about her skills as a pilot and wants to impress them with her abilities. During her third solo flight she decides to take a friend for a helicopter ride.	**Taking chances is foolish.**
Anti-authority—In the air she thinks "It's great to be up here without an instructor criticizing everything I do. His do-it-by-the-book attitude takes all of the fun out of flying."	**Follow the rules. They are usually right.**
Invulnerability—As she nears her friends farm, she remembers that it is about eight miles from the closest airport. She thinks, "I'll land in the pasture behind the barn at Sarah's farm. It won't be dangerous at all... the pasture is fenced and mowed and no animals are in the way. It's no more dangerous than landing at a heliport."	**It could happen to me.**
Impulsivity—After a short look, Brenda initiates an approach to her friend's pasture. Not realizing that she is landing with a tail wind, she makes a hard landing in the pasture and nearly hits the fence with the tail rotor before she gets the helicopter stopped.	**Not so fast. Think first.**
Resignation—A policeman pulls up to investigate what he believes to be an emergency landing. As Brenda is walking from the helicopter, she is supprised that anyone observed her landing. Her first thought is "if it weren't for my bad luck, this policeman wouldn't have come along and this would have been a great afternoon."	**I'm not helpless. I can make a difference.**

Figure 14-7. You must be able to identify hazardous attitudes and apply the appropriate antidote when needed.

a hazardous attitude, correctly label the thought, and then recall its antidote. [Figure 14-7]

STRESS MANAGEMENT

Everyone is stressed to some degree all the time. A certain amount of stress is good since it keeps a person alert and prevents complacency. However, effects of stress are cumulative and, if not coped with adequately, they eventually add up to an intolerable burden. Performance generally increases with the onset of stress, peaks, and then begins to fall off rapidly as stress levels exceed a person's ability to cope. The ability to make effective decisions during flight can be impaired by stress. Factors, referred to as stressors, can increase a pilot's risk of error in the cockpit. [Figure 14-8]

There are several techniques to help manage the accumulation of life stresses and prevent stress overload. For example, including relaxation time in a busy schedule and maintaining a program of physical fitness can help reduce stress levels. Learning to manage time more effectively can help you avoid heavy pressures imposed by getting behind schedule and not meeting deadlines. Take an assessment of yourself to determine your capabilities and limitations and then set realistic goals. In addition, avoiding stressful situations and encounters can help you cope with stress.

USE OF RESOURCES

To make informed decisions during flight operations, you must be aware of the resources found both inside and outside the cockpit. Since useful tools and sources of information may not always be readily apparent, learning to recognize these resources is an essential part of ADM training. Resources must not only be iden-

STRESSORS

Physical Stress—Conditions associated with the environment, such as temperature and humidity extremes, noise, vibration, and lack of oxygen.

Physiological Stress—Physical conditions, such as fatigue, lack of physical fitness, sleep loss, missed meals (leading to low blood sugar levels), and illness.

Psychological Stress—Social or emotional factors, such as a death in the family, a divorce, a sick child, or a demotion at work. This type of stress may also be related to mental workload, such as analyzing a problem, navigating an aircraft, or making decisions.

Figure 14-8. The three types of stressors that can affect a pilot's performance.

tified, but you must develop the skills to evaluate whether you have the time to use a particular resource and the impact that its use will have upon the safety of flight. For example, the assistance of ATC may be very useful if you are lost. However, in an emergency situation when action needs be taken quickly, time may not be available to contact ATC immediately.

INTERNAL RESOURCES

Internal resources are found in the cockpit during flight. Since some of the most valuable internal resources are ingenuity, knowledge, and skill, you can expand cockpit resources immensely by improving these capabilities. This can be accomplished by frequently reviewing flight information publications, such as the CFRs and the AIM, as well as by pursuing additional training.

A thorough understanding of all the equipment and systems in the aircraft is necessary to fully utilize all resources. For example, advanced navigation and autopilot systems are valuable resources. However, if pilots do not fully understand how to use this equipment, or they rely on it so much that they become complacent, it can become a detriment to safe flight.

Checklists are essential cockpit resources for verifying that the aircraft instruments and systems are checked, set, and operating properly, as well as ensuring that the proper procedures are performed if there is a system malfunction or in-flight emergency. In addition, the FAA-approved rotorcraft flight manual, which is required to be carried on board the aircraft, is essential for accurate flight planning and for resolving in-flight equipment malfunctions. Other valuable cockpit resources include current aeronautical charts, and publications, such as the *Airport/Facility Directory*.

Passengers can also be a valuable resource. Passengers can help watch for traffic and may be able to provide information in an irregular situation, especially if they are familiar with flying. A strange smell or sound may alert a passenger to a potential problem. As pilot in command, you should brief passengers before the flight to make sure that they are comfortable voicing any concerns.

EXTERNAL RESOURCES

Possibly the greatest external resources during flight are air traffic controllers and flight service specialists. ATC can help decrease pilot workload by providing traffic advisories, radar vectors, and assistance in emergency situations. Flight service stations can provide updates on weather, answer questions about airport conditions, and may offer direction-finding assistance. The services provided by ATC can be invaluable in enabling you to make informed in-flight decisions.

WORKLOAD MANAGEMENT

Effective workload management ensures that essential operations are accomplished by planning, prioritizing, and sequencing tasks to avoid work overload. As experience is gained, you learn to recognize future workload requirements and can prepare for high workload periods during times of low workload. Reviewing the appropriate chart and setting radio frequencies well in advance of when they are needed helps reduce workload as your flight nears the airport. In addition, you should listen to ATIS, ASOS, or AWOS, if available, and then monitor the tower frequency or CTAF to get a good idea of what traffic conditions to expect. Checklists should be performed well in advance so there is time to focus on traffic and ATC instructions. These procedures are especially important prior to entering a high-density traffic area, such as Class B airspace.

To manage workload, items should be prioritized. For example, during any situation, and especially in an emergency, you should remember the phrase "aviate,

navigate, and communicate." This means that the first thing you should do is make sure the helicopter is under

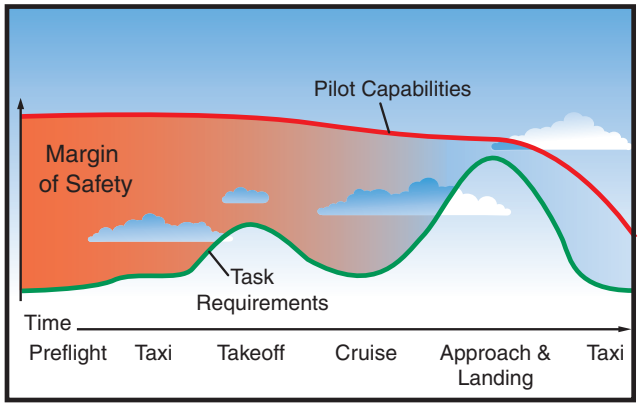

Figure 14-9. Accidents often occur when flying task requirements exceed pilot capabilities. The difference between these two factors is called the margin of safety. Note that in this idealized example, the margin of safety is minimal during the approach and landing. At this point, an emergency or distraction could overtax pilot capabilities, causing an accident.

control. Then begin flying to an acceptable landing area. Only after the first two items are assured, should you try to communicate with anyone.

Another important part of managing workload is recognizing a work overload situation. The first effect of high workload is that you begin to work faster. As workload increases, attention cannot be devoted to several tasks at one time, and you may begin to focus on one item. When you become task saturated, there is no awareness of inputs from various sources, so decisions may be made on incomplete information, and the possibility of error increases. [Figure 14-9]

When becoming overloaded, you should stop, think, slow down, and prioritize. It is important that you understand options that may be available to decrease workload. For example, tasks, such as locating an item on a chart or setting a radio frequency, may be delegated to another pilot or passenger, an autopilot, if available, may be used, or ATC may be enlisted to provide assistance.

SITUATIONAL AWARENESS

Situational awareness is the accurate perception of the operational and environmental factors that affect the aircraft, pilot, and passengers during a specific period of time. Maintaining situational awareness requires an understanding of the relative significance of these factors and their future impact on the flight. When situationally aware, you have an overview of the total operation and are not fixated on one perceived significant factor. Some of the elements inside the aircraft to be considered are the status of aircraft systems, you as the pilot, and passengers. In addition, an awareness of the environmental conditions of the flight, such as spatial orientation of the helicopter, and its relationship to terrain, traffic, weather, and airspace must be maintained.

To maintain situational awareness, all of the skills involved in aeronautical decision making are used. For example, an accurate perception of your fitness can be achieved through self-assessment and recognition of hazardous attitudes. A clear assessment of the status of navigation equipment can be obtained through workload management, and establishing a productive relationship with ATC can be accomplished by effective resource use.

OBSTACLES TO MAINTAINING SITUATIONAL AWARENESS

Fatigue, stress, and work overload can cause you to fixate on a single perceived important item rather than maintaining an overall awareness of the flight situation. A contributing factor in many accidents is a distraction that diverts the pilot's attention from monitoring the instruments or scanning outside the aircraft. Many cockpit distractions begin as a minor problem, such as a gauge that is not reading correctly, but result in accidents as the pilot diverts attention to the perceived problem and neglects to properly control the aircraft.

Complacency presents another obstacle to maintaining situational awareness. When activities become routine, you may have a tendency to relax and not put as much effort into performance. Like fatigue, complacency reduces your effectiveness in the cockpit. However, complacency is harder to recognize than fatigue, since everything is perceived to be progressing smoothly. For example, you have just dropped off another group of fire fighters for the fifth time that day. Without thinking, you hastily lift the helicopter off the ground, not realizing that one of the skids is stuck between two rocks. The result is dynamic rollover and a destroyed helicopter.

OPERATIONAL PITFALLS

There are a number of classic behavioral traps into which pilots have been known to fall. Pilots, particularly those with considerable experience, as a rule, always try to complete a flight as planned, please passengers, and meet schedules. The basic drive to meet or exceed goals can have an adverse effect on safety, and can impose an unrealistic assessment of piloting skills under stressful conditions. These tendencies ultimately may bring about practices that are dangerous and often illegal, and may lead to a mishap. You will develop awareness and learn to avoid many of these operational pitfalls through effective ADM training. [Figure 14-10]

OPERATIONAL PITFALLS

Peer Pressure—Poor decision making may be based upon an emotional response to peers, rather than evaluating a situation objectively.

Mind Set—A pilot displays mind set through an inability to recognize and cope with changes in a given situation.

Get-There-Itis—This disposition impairs pilot judgment through a fixation on the original goal or destination, combined with a disregard for any alternative course of action.

Scud Running—This occurs when a pilot tries to maintain visual contact with the terrain at low altitudes while instrument conditions exist.

Continuing Visual Flight Rules (VFR) into Instrument Conditions—Spatial disorientation or collision with ground/obstacles may occur when a pilot continues VFR into instrument conditions. This can be even more dangerous if the pilot is not instrument-rated or current.

Getting Behind the Aircraft—This pitfall can be caused by allowing events or the situation to control pilot actions. A constant state of surprise at what happens next may be exhibited when the pilot is getting behind the aircraft.

Loss of Positional or Situational Awareness—In extreme cases, when a pilot gets behind the aircraft, a loss of positional or situational awareness may result. The pilot may not know the aircraft's geographical location, or may be unable to recognize deteriorating circumstances.

Operating Without Adequate Fuel Reserves—Ignoring minimum fuel reserve requirements is generally the result of overconfidence, lack of flight planning, or disregarding applicable regulations.

Flying Outside the Envelope—The assumed high performance capability of a particular aircraft may cause a mistaken belief that it can meet the demands imposed by a pilot's overestimated flying skills.

Neglect of Flight Planning, Preflight Inspections, and Checklists—A pilot may rely on short- and long-term memory, regular flying skills, and familiar routes instead of established procedures and published checklists. This can be particularly true of experienced pilots.

Figure 14-10. All experienced pilots have fallen prey to, or have been tempted by, one or more of these tendencies in their flying careers.